CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding an N-acetylglutamate kinase comprising a member selected from the group consisting of:

(a) an isolated nucleic acid fragment encoding an amino acid sequence that is at least 95% identical to the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6 and SEQ ID NO:8 and encoding a functional enzyme;

(b) an isolated nucleic acid fragment that is complementary to (a).

2. The isolated nucleic acid fragment of Claim 1 wherein nucleic acid fragment is a functional RNA.

3. The isolated nucleic acid fragment of Claim 1 wherein the nucleotide sequence of the fragment comprises the sequence set forth in a member selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 and SEQ ID NO:7.

4. A chimeric gene comprising the nucleic acid fragment of Claim 1 operably linked to suitable regulatory sequences.

5. A transformed host cell comprising the chimeric gene of Claim 4.

6. An isolated nucleic acid fragment encoding an N-acetylglutamate kinase having the sequence set forth in SEQ ID NO:12, where:

Xaa at position 2 is Leu or Met,
Xaa at position 3 is Leu or Ala,
Xaa at position 4 or 176 is Thr, Ala or Gly,
Xaa at position 5 is Pro or none,
Xaa at position 6 is Trp, His or none,
Xaa at position 7 is Leu or none,
Xaa at position 8, 9, or 46 is Ser, Ala or none,
Xaa at position 10 is Ser, Lys or Pro,
Xaa at position 11 is Lys, Ser, Thr or Ala,
Xaa at position 12 Leu or Phe,
Xaa at position 13 is Pro, Thr or none,
Xaa at position 14 is Val, Leu or Asn,
Xaa at position 15 is Pro or Leu,
Xaa at position 16 or 182 is Ser or Cys,
Xaa at position 17 or 36 is Pro, Thr or Ala,
Xaa at position 18 is Pro, Arg or Ser,
Xaa at position 19 is Pro, Val, Phe or Leu,
Xaa at position 20 or 30 is Ser, Lys, Thr or Arg,

Xaa at position 21 is Gly, Phe or Asn,
Xaa at position 23 or 50 is Thr, Ala or Asn,
Xaa at position 24 is Leu, Pro or Lys,
Xaa at position 25 is Ser, Gly, Pro or Lys,
Xaa at position 26 is Ser, Pro, Gln or Ala,
Xaa at position 27 is Asn or Ala,
Xaa at position 28 is His, Gln or Arg,
Xaa at position 29 is Ala, Leu or Val,
Xaa at position 31 is Pro or Thr,
Xaa at position 32 is Leu, Ile or Ser,
Xaa at position 33 is Ala or His,
Xaa at position 34, 49, 51, 52, 74, 194, 252, 256 or 309 is Ala or Ser,
Xaa at position 35 is Pro, Ser or Phe,
Xaa at position 37 is Cys, Ala, Ser or Pro,
Xaa at position 38 is Arg, Pro, Thr or His,
Xaa at position 39 is Arg, Gly or none,
Xaa at position 40 or 43 is Arg or Leu,
Xaa at position 41 is Ser or Arg,
Xaa at position 42 is Arg, Cys, His or Gly,
Xaa at position 44 is Arg or Ala,
Xaa at position 45 or 253 is Ile, Leu or Val,
Xaa at position 47 is Ala, Val or none,
Xaa at position 48 is Thr, Val or none,
Xaa at position 53 is Pro, Gln or Ser,
Xaa at position 54 or 57 is Ser, Ala or Pro,
Xaa at position 55 is Pro, Ala or Leu,
Xaa at position 56 is Ser, Leu or Ala,
Xaa at position 59 is Ala, Glu or Gln,
Xaa at position 60, 227 or 428 is Ala or Thr,
Xaa at position 62 is Thr, Ser or none,
Xaa at position 63, 191, 197, 269 or 291 is Glu or Ala,
Xaa at position 64 is Ala, Ser or Gly,
Xaa at position 65 id Leu or Gln,
Xaa at position 66 is Ser, Tyr or Asn,
Xaa at position 80 or 82 is Arg or Lys,
Xaa at position 86, 137, 154, 179, 226, 281 is Val or Ile,
Xaa at position 106 is Arg or Asn,
Xaa at position 117, 215 or 308 is Arg or His,

Xaa at position 133 is Leu, Gly or Gln,
Xaa at position 135 or 209 is Val or Lys,
Xaa at position 136 is Gly or Asn.
Xaa at position 138 is Glu or Pro,
Xaa at position 139 is Gln or Val,
Xaa at position 142, 210 or 272 is Asp or Asn.
Xaa at position 150 is Leu or Asp,
Xaa at position 151 or 190 is Thr or Asn,
Xaa at position 156 is Glu or Ser,
Xaa at position 161 or 201 is Gly or Arg,
Xaa at position 166 is Asn, Glu, Thr or Gln,
Xaa at position 172 is Asn, Lys or Arg,
Xaa at position 173 is Ile, Leu, Lys or Pro,
Xaa at position 174, 211 or 237 is Ala or Pro.
Xaa at position 177, 228 or 234 is Thr or Ser.
Xaa at position 180 or 221 is Gly or Ser,
Xaa at position 183 is Gly, Trp or Arg,
Xaa at position 184 is Lys or Met,
Xaa at position 185 or 292 is Asp or Glu,
Xaa at position 186, 230 or 296 is Gly or Ala,
Xaa at position 189, 217, 249, 259 or 261 is Ile or Leu,
Xaa at position 196 is Asn, Lys or Asp,
Xaa at position 198 or 284 is Lys or Ala,
Xaa at position 199 is Ala, Gly or Asp,
Xaa at position 202 is Phe or Tyr,
Xaa at position 205 is Glu or Gly,
Xaa at position 207 is Ser, Trp, Ala or Thr,
Xaa at position 212 or 220 is Thr, Ala or Ser,
Xaa at position 216 is Pro or Ser,
Xaa at position 219 is Ala or Asp,
Xaa at position 245 is Ala or Val,
Xaa at position 275 is Gly or Asp,
Xaa at position 280 is Val, Glu or Lys,
Xaa at position 288 is Lys, Gln or Arg,
Xaa at position 290 is Val or Met,
Xaa at position 294 is Lys or Gln,
Xaa at position 304 is Glu, Asn or Gly,
and Xaa at position 405 is His or Ile.

7. A method for evaluating at least one compound for its ability to inhibit the activity of an N-acetylglutamate kinase, the method comprising the steps of:

(a) transforming a host cell with a chimeric gene comprising a nucleic acid fragment encoding an N-acetylglutamate kinase. operably linked to suitable regulatory sequences;

(b) growing the transformed host cell under conditions that are suitable for expression of the chimeric gene wherein expression of the chimeric gene results in production of the N-acetylglutamate kinase encoded by the operably linked nucleic acid fragment in the transformed host cell;

(c) optionally purifying the N-acetylglutamate kinase expressed by the transformed host cell;

(d) treating the N-acetylglutamate kinase with a compound to be tested; and

(e) comparing the activity of the N-acetylglutamate kinase that has been treated with a test compound to the activity of an untreated N-acetylglutamate kinase,

thereby selecting compounds with potential for inhibitory activity.

Add B3